In the Claims

Please amend the claims as indicated in the following List of Claims.

1. (currently amended) An apparatus for providing and circulating to a medical device a medical gas mixture comprising at least two components, said apparatus comprising:

a main gas circuit for recirculating the medical gas mixture and comprising:

a constant speed circulation pump for pumping gas through the main circuit and increasing the gas pressure from a lower pressure to a higher pressure,

a pressure maintaining valve downstream of the pump and dividing the main circuit into a higher pressure section and a lower pressure section in order to maintain a constant pressure in the higher pressure section,

a medical gas outlet in the higher pressure section,

a spent gas inlet in the lower pressure section,

a first feed gas supply inlet,

a second feed gas supply inlet downstream of the medical gas outlet and upstream of the pressure reduction valve,

concentration determining means for measuring the concentration of at least one component of the recirculating medical gas mixture and generating a signal indicative of said concentration,

circuit volume regulating means for varying the volume of the main circuit at a location in the lower pressure section for maintaining a predetermined gas flow to the pump and generating a signal indicative of said volume, and

means for venting gas from the main circuit;

a first feed gas supply conduit for supply to the first feed gas supply inlet of a first feed gas of predetermined composition;

first feed gas supply flow control means for controlling the flow of first feed gas through the first gas supply conduit in response to the signal from the concentration determining means to maintain constant the medical gas composition at the pump inlet;

a second feed gas supply conduit for supply to the second feed gas supply inlet of a second feed gas of predetermined composition different from the first feed gas;

second feed gas supply flow control means for controlling the flow of second feed gas through the second gas supply conduit in response to the signal from the circuit volume regulating

means to maintain constant the recirculating medical gas composition; and

a medical device supply circuit for connecting the medical device to the main circuit to receive a portion of the medical gas from the medical gas outlet thereof and to return spent gas to the spent gas inlet thereof and comprising:

flow control means for controlling flow of the medical gas to the medical device and

purification means for removing contaminant(s) from the spent gas.

2. (previously) The apparatus according to Claim 1, wherein the feed gas supply inlets are located in the higher pressure section.

3. (previously amended) The apparatus according to Claim 1, wherein the pressure maintaining valve is a spill valve.

4. (previously amended) The apparatus according to Claim 1, wherein the circuit volume regulating means comprises expansion bellows.

5. (currently amended) The apparatus according to Claim 1, wherein the concentration determining means comprises ~~a relatively high gain~~ an analog electrical circuit for the signal thereof and the circuit volume regulating means comprises ~~a relatively low gain~~ an analog electrical circuit for the signal thereof which is of lower gain than that of the circuit for the signal of the concentration determining means, whereby the increase in flow rate of the first feed gas is ~~relatively~~ quick relative to ~~and~~ the increase in flow rate of the second feed gas ~~is relatively slow~~.

6. (previously amended) The apparatus according to Claim 1, wherein the concentration determining means measures at least oxygen concentration.

7. (cancelled)

8. (cancelled)

9. (previously amended) The apparatus according to Claim 1, which further comprises an ultrasonic xenon analyser.

10. (previously amended) The apparatus according to Claim 1, wherein the means for venting gas from the main circuit comprising a gas recovery space for storing at least a portion of the vented gas.

11. (previously amended) The apparatus according to Claim 10, wherein the gas recovery space is an ullage space of a container providing one of the feed gases.

12. (previously amended) A medical device system comprising a medical device connected to the medical device supply circuit of an apparatus as defined in Claim 1.

13. (previously amended) The system according to Claim 12, wherein the medical device is an artificial ventilator.

14. (previously amended) The system according to Claim 12, wherein the medical device is a cardiopulmonary bypass oxygenator.

15. (cancelled)

16. (original) A method of providing a medical device with a medical gas mixture comprising at least two components, said method comprising:-

recirculating the medical gas mixture in a main circuit having a higher pressure section maintained at constant pressure in series with a lower pressure section;

withdrawing a portion of the medical gas mixture from the higher pressure section and feeding said portion to the medical device;

removing contaminant(s) from the spent gas mixture from the medical device and returning the decontaminated spent gas to lower pressure section;

replenishing components in the medical gas mixture by addition of feed gases to maintain the recirculating medical gas composition constant; and

varying the volume of the main gas circuit to maintain the gas flow therein.

17. (cancelled)

18. (cancelled)

19. (cancelled)

20. (cancelled)

21. (cancelled)

22. (cancelled)

23. (cancelled)

24. (previously amended) A method for the extracorporeal treatment of blood by contacting blood with a recirculating medical gas mixture in a device provided with the medical gas mixture using a method defined in Claim 16.